

Non-Suicidal Self-Injury and Indirect Self-Harm Among Danish High School Students

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Abstract

Background: Non-suicidal self-injury (NSSI) and indirect self-harm are prevalent among adolescents, but it is rare to see them described as related topics.

Objective: The purpose of this study was to investigate whether there is a correlation between the frequencies of NSSI and indirect self-harm (e.g., eating problems, alcohol and drug use) and how this may be influenced by gender.

Method: Questionnaires about NSSI (e.g., cutting, burning, scratching, hitting oneself) and indirect self-harm were distributed to high school students in the Copenhagen area (N = 5650; response rate 53%; females 60.8%).

Results: A total of 21.5% of the survey respondents had engaged in NSSI (lifetime prevalence), and 16.2% had practiced NSSI within the previous year. Gender differences in NSSI methods were identified. A total of 53.9% of the students had engaged in one or more types of indirect self-harm. The correlation between NSSI and indirect self-harm is twice as high for males (0.44; $P < .001$) as compared with females (0.20; $P < .001$).

Conclusions: Clinicians must be aware of both NSSI and indirect self-harm. A positive correlation is seen, especially among young males. Males often perform other kinds of NSSI as compared with females, and clinicians must look for gender-specific signs of NSSI. It is argued that NSSI can be perceived as a “social pathology,” but it is also indicated that NSSI and indirect self-harm can be evaluated as an expression of ordinary behavior among modern high school students that must not be medicalized.

Keywords: Non-suicidal self-injury (NSSI), methods of non-suicidal self-injury, gender-specific NSSI, indirect self-harm, adolescents, social pathology

Introduction

For the last 10 to 12 years, the incidence of self-harming behavior among adolescents in Western countries has increased dramatically, but the prevalence of non-suicidal self-injury (NSSI) has probably reached its maximum (1). Self-harming behavior has reached a level that indicates that self-harm is no longer just a problem for the individual; rather, it has become a public health issue or a new “social pathology” (2). There has been an increase in NSSI that has an immediate effect on the body as well as on behavior, with possible long-term harmful consequences resulting from indirect self-harm (e.g., alcohol and drug abuse) (3).

To make a clear distinction between NSSI and indirect self-harm, we will apply the definition of NSSI provided by the International Society for the Study of Self-Injury. Here, *direct NSSI* is defined as “the deliberate, direct, and self-inflicted destruction of body tissue resulting in immediate tissue damage, for purposes not socially sanctioned and without suicidal intent” (4). This definition eliminates self-injurious behavior with suicidal intent as well as both indirect self-harm and socially sanctioned behavior (e.g., piercing, tattooing, and plastic surgery). Cutting, burning, scratching, and hitting oneself are examples of NSSI.

Indirect self-harm is defined as an activity that results in damages that are unintended side effects of the act. The damages do not occur immediately but rather are deferred or are long-term consequences of accumulation. For the person engaged in indirect self-harming behavior, the negative impact is unknown and often a matter of risk or luck. There are varying degrees of indirect self-harm; these include less severe forms (e.g., drinking wine with dinner, smoking, eating high-fat fast food) as well as more severe forms, which are no longer just bad habits but instead clear-cut risky behaviors.

For the purposes of this study, indirect self-harm is defined as eating problems (e.g., deliberately starving oneself, deliberately vomiting after having eaten too much), consuming alcohol to the point of blackout, or taking illegal drugs (e.g., amphetamines, LSD, heroin).

Shneidman (5) links indirect self-harm to suicide and emphasizes that drinking alcohol, using drugs, smoking, and even not eating a healthy diet can be seen as a kind of “sub-intentional suicidal behavior,” because it can “clearly jeopardize one’s health and longevity.” Although indirect self-harm is not a conscious expression of a death wish, it can be fatal in the long run. The same can be said about direct self-harm or NSSI. The line between self-harm and suicide attempts is easier to draw academically than clinically (5).

The prevalence of NSSI among non-clinical populations is reported to be between 4% and 41.5%, varying with the group being studied and the definition of self-harming behavior (1;6-8). Especially among high school and college students, the prevalence of NSSI is high (9;10). A Danish study of NSSI in high schools finds a lifetime prevalence of 21.5%. A total of 16.2% of the students had performed NSSI within the previous year (11).

Cutting is the most frequent form of NSSI (12;13); this is followed by scratching, burning, and hitting oneself (14). Males and females use different methods of NSSI. Studies find that more females cut themselves and that more males hit themselves, but both genders exhibit a variety of NSSI methods (15-17).

Experimentation with alcohol and drugs as well as eating problems is common among Danish adolescents (3). Danish youths have the highest consumption of alcohol in Europe (18). A Danish study of quality of life among 17- to 24-year-old Danes found that 94.0% of males and 90.7% of females are alcohol consumers and that 32.6% and 16.6% of these groups, respectively, are drunk at least once a week (3). According to the National Board of Health (19), 44.5% of Danish youths between 16 and 34 years old have used cannabis,

and 14.4% have used other illicit drugs (e.g., amphetamines, LSD, heroin).

A survey of 15- to 19-year-old Danes found that 39.1% of females and 20.9% of males are often or always thinking about their weight (3). Another Danish study found that 25% of females and 3% of males between 14 and 21 years old have frequently been on a diet and that 30% of females and 24% of males have had frequent episodes of binge eating. In addition, 25% of females are estimated to be at risk for the development of an eating disorder (20).

Despite the fact that many studies have documented that NSSI is prevalent among adolescents and that other studies have documented that many adolescents have indirect self-harming behavior with the use of illicit drugs and alcohol or eating problems, it is rare to see NSSI and indirect self-harm described as related topics. Most of the literature that addresses NSSI and indirect self-harm is largely non-overlapping (21), although it is a common clinical experience to find a positive correlation between NSSI and indirect self-harm (22;23). If a patient cuts herself, the risk that she has an abnormal eating pattern or consumes too much alcohol is increased, and vice versa (24). A study by Favaro and colleagues (25) confirmed the significant correlation between NSSI and other forms of self-harming behavior, including alcohol and substance abuse, suicidal behavior, and eating disorders. These findings are confirmed by studies that demonstrate a positive correlation between NSSI and eating disorders (26), NSSI and substance abuse (27), and NSSI and alcohol consumption (28).

NSSI and indirect self-harm have some common features. In both conditions, the body is used as a medium to regulate the state of mind, the social situation, or both. NSSI and indirect self-harm represent attempts to modify the mental or social state of the individual (e.g., affect regulation, relaxing, coping with difficulties, altering consciousness) (29). NSSI and indirect self-harm are correlated with different forms of mental disorders (e.g., depression, anxiety, personality disorders) (21) and the risk of suicide (30;31). NSSI and severe types of indirect self-harm are indicators of distress and failure to succeed (3).

However, an important difference between NSSI and indirect self-harm is that the latter is not necessarily performed with the intent to harm the body; the behavior is therefore not considered self-harm by the person who is performing it. From an outside perspective, NSSI and indirect self-harm seem to be two sides of the same coin, but it is important to make a clear distinction, because NSSI and indirect self-harm are perceived and defined differently by the individuals who are performing the behavior.

The purpose of this article is to examine the possible correlations between different types of NSSI and indirect self-harm among male and female high school students in the Copenhagen area. Suicidal behavior is excluded from this study, and the focus is on some of the common but harmful coping strategies that are seen among high school students. This study is part of a larger study of self-harming behavior among Danish high school students in the Copenhagen area (11).

Methods

Participants

The participation of fourteen high schools in the Copenhagen area was requested, and the high schools were selected for being a representative cross-section of Danish urban society. Seven schools agreed to participate. There were no significant differences in size or sociodemographic position between the participating and non-participating schools.

Among the students from the seven schools ($N = 5650$), the response rate was 53% (range, 41% to 62%). Because the prevalence of NSSI and indirect self-harm per school varied little with the school's response rate, we do not believe that non-response bias is a major issue.

Some of the questionnaires were ambiguous, or suggested suicidal thinking, 135 were excluded from the study, and we were left with a sample size of 2864. This group consisted of 1123 males (39.2%) and 1741 females (60.8%) between the ages of 16 and 19 years. Gender data were missing in some cases.

Data and design

Data were collected from a one-page questionnaire handed out by the teachers. The questionnaire was constructed by the authors to obtain basic information about NSSI and indirect self-harm. It is reproduced in a translated version as an appendix to this paper. Students had 1 week to complete the questionnaire and could return it anonymously by putting it into specially designed mailboxes at the high schools.

The questionnaire focuses on different types of NSSI and starts with a yes-or-no question asking whether the respondent has *ever* engaged in NSSI ("Have you ever in your life deliberately harmed yourself [for example cut, burned, scratched, or hit yourself] without the intention of killing yourself?"). If the student answered yes to that question, he or she was asked to go on to the next question, which asked how he or she had performed NSSI ("How did you harm yourself?"), with the possibility of answering yes or no to the following types of NSSI: cutting, burning, scratching, hitting, or other types

of NSSI. To reveal indirect self-harming behavior, we asked the respondent to answer yes or no to the following questions: "Have you ever deliberately starved yourself and/or deliberately vomited when having eaten too much?" "Have you ever drunk so much alcohol that you blacked out?" and "Have you ever taken drugs (amphetamine, LSD, heroin, or the like)?"

Data were analyzed with the use of SPSS software version 18, with standard settings used for all tests involved. A principal component analysis (PCA) was performed with varimax rotation and Kaiser normalization.

Ethics

The Ethics Board of Science in Copenhagen received a copy of the questionnaire and protocol for their review. They had no annotations, and the study was approved.

Results

Non-suicidal self-injury

The 21.5% of the students who filled out the questionnaire ($N = 2864$) had performed NSSI at some point in their lives (lifetime prevalence). Minor gender differences were seen (females, 22.3%; males, 18.9%), but the difference was not significant ($P = .3$ [chi-squared test]).

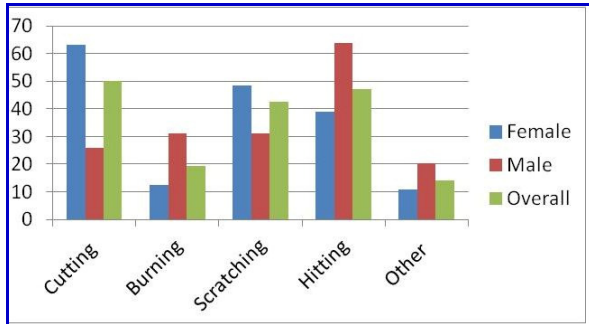
An average of 16.2% (15.9% females, 16.6% males) performed NSSI during the year preceding their answering of the questionnaire. Further details are described by Möhl and Skandsen (11).

The variety of NSSI methods used by those who had performed NSSI is summarized in Table 1. As seen, a total of 643 (21.5%) of the full sample had performed NSSI at least once during their lives. Large gender differences are found with two types of self-harm, which may thus be considered gender-specific methods. Of the 50.0% of respondents who had cut themselves, the females held the dominant position at 63.1%, with males having a rate of 25.9% ($P < .001$ for gender difference chi-squared test). The opposite was the case among the 47.0% of respondents who hit themselves. This specific form was dominated by males at 63.8%, with females having a rate of 38.8% ($P < .001$). For a graphical overview, see Figure 1.

Of the students who performed NSSI, 53.2% had used only one of the listed methods; 27.8% used two methods, 10.6% used three methods, 6.2% used four methods, and 1.9% used all of the listed methods.

TABLE 1. Non-suicidal self-injury methods within the group that harmed themselves (N=643)

	Female	Male	Overall
Cutting	243 (63.1%)	55 (25.9%)	322 (50.0%)
Burning	48 (12.3%)	68 (31.2%)	124 (19.3%)
Scratching	188 (48.3%)	68 (31.2%)	273 (42.5%)
Hitting	151 (38.8%)	139 (63.8%)	302 (47.0%)
Other	42 (10.8%)	44 (20.2%)	91 (14.2%)

**FIGURE 1. Types of self-harm. Percentage of type within the group of self-harmers***Indirect self-harm*

A total of 53.9% of the students indicated that they have experiences with one type of indirect self-harming behavior: either eating problems (deliberately starving or deliberately vomiting when having eaten too much), consuming alcohol to the point of blackout, or taking illegal drugs (e.g., amphetamines, LSD, heroin). More specifically, 12.6% indicated experiences with two different types of indirect self-harm, and 2.7% indicated experiences with all three types of indirect self-harm. As shown in Table 2, alcohol blackout seems to be especially common among Danish high school students.

TABLE 2. Indirect self-harming behavior in the full sample (N=2622)

	Female	Male	Overall
Eating Problems	438 (28.2%)	73 (7.6%)	536 (20.4%)
Alcohol blackout	625 (40.4%)	482 (48.5%)	1174 (43.9%)
Drug use	105 (6.8%)	140 (14.4%)	262 (10.0%)

Correlations between non-suicidal self-injury and indirect self-harm

Variables that contained information about how many types of NSSI and indirect self-harm the individual had been practicing were correlated (Pearson). Correlations between NSSI and indirect self-harm in the full sample were 0.3 (Pearson; $P < .001$). When the sample was divided into gender, the correlation was twice as high for males (0.44; $P < .001$) as compared with females (0.20; $P < .001$).

TABLE 3. Gender-specific correlations between sums of non-suicidal self-injury and sums of indirect self-harm

Females	Indirect type sum	378
	Non-suicidal self-injury sum	389 (Pearson correlation = 0.20; $P < .001$)
Males	Indirect type sum	211
	Non-suicidal self-injury sum	442 (Pearson correlation = 0.44; $P < .001$)

Factor analysis of self-harm

After combining all of the types of self-harm, we did a factor analysis to investigate eventually underlying patterns. Considering the eigenvalues and the scree plot, a three-factor solution was chosen as presented in Table 4.

The different types of NSSI and indirect self-harm are intercorrelated in such a way that three groups can be described separately:

1. *Outward active self-harm.* The first group consisted of individuals who had performed outward active self-harm methods: students taking drugs, drinking themselves to the point of blackout, and burning themselves. The category of “other” also belongs with this factor, but the nature of self-harm types in this category is widely unknown. The group of 379 persons (63.9% of the self-harmers) who had performed one of these types of self-harm was characterized by being mainly male (77.5% [versus females at 56.3%]), and the gender difference grows when more than one type of self-harm is involved.
2. *Less-invasive self-harm.* The second group consisted of students who had performed less-invasive types of self-injury, such as eating problems and scratching. This group consisted of 360 individuals (60%) and was predominantly female.
3. *Gender-specific self-harm.* The third group included the two gender-specific NSSIs (cutting and hitting oneself), which are highly but inversely correlated as a result of the gender issue. The persons who perform the one type of self-harm are not performing the other type. The group of students who had performed one of these types of self-harm included 480 individuals (79.0%).

TABLE 4. Principal component analysis of non-suicidal self-injury and indirect self-harm

Factor	1	2	3
Drug use	.753		
Blackout	.658		
Burning	.643		
Other	.427		
Scratching		.741	
Eating problem		.689	.332
Hitting			-.788
Cutting		.361	.724

For all values, the following factors were used:
Varimax rotation with Kaiser normalization; eigenvalue >1; cutoff, <0.3

Discussion

The purpose of this study was to investigate the connection between NSSI and indirect self-harming behavior in a gender context. The findings indicate that about three to four students in each grade of high school have had at least one incidence of NSSI within the previous year. This corresponds with the results of other studies of NSSI among high school students (9). More than half of the students in the study had engaged in one or more types of indirect self-harm (e.g., eating problems, consuming alcohol to the point of blackout, taking illicit drugs). To our knowledge, no other Danish studies have investigated the prevalence of alcohol blackout among high school students, but the incidence of eating problems of either a restrictive or bulimic type found in our study corresponds with what has been found in other Danish studies (32).

When it comes to experiences with illicit drugs (e.g., amphetamines, LSD, heroin), the figures obtained by this study are *below* the national average, according to a study by the National Board of Health (19). This study found that 10% of students (14.4% of males, 6.8% of females) had tried one or more of the above-mentioned drugs at least once, whereas the National Board of Health (19) found that 14.4% of the population between the ages of 16 and 34 years had tried illicit drugs (except for marijuana) at least once in their lives. The lower figures in this study could be explained by the fact that the students are younger (i.e., 16 to 19 years old) than the participants in the National Board of Health study.

This study confirms a connection between NSSI and indirect self-harm, which has been found in other surveys as well (25). The correlation between NSSI and indirect self-harm is twice as high for males (0.442) as for females (0.200), and more males have engaged in the more severe forms of NSSI (e.g., burning) as well as indirect self-harm (e.g., drug use, alcohol blackout). The higher correlation between NSSI and indirect self-harm may indicate a more smooth transition between NSSI and indirect self-harm among males. An explanation may be that excessive drinking and the intake of drugs reduces self-control, thereby increasing the risk of acting out with NSSI. Further studies are required to confirm this.

In accordance with other studies (17;33), significant gender differences with regard to methods of NSSI and indirect self-harm were found in this study. The majority of females who have engaged in NSSI have cut themselves, whereas the most frequent form of NSSI among males is hitting themselves. It seems that males in this study are

generally more self-harming and self-destructive in their lifestyles than females are. Males dominate in the outward self-harming group, with members who drink themselves to the point of blackout, take drugs, and burn themselves. This pattern was confirmed in a previous part of the study, which showed that males are involved in a more persistent and intense form of self-injurious behavior than females, who tend to stop NSSI or to practice it less during the last years in high school (11). This is in line with the study by Claes and colleagues (34), who found that males who performed NSSI reported a greater number of NSSI episodes per day than females did.

This study does not address the reasons behind the gender differences in NSSI methods and indirect self-harming behavior, but the patterns found here seem to reflect the gender stereotypes of Western culture. Several studies indicate that females under emotional stress tend to internalize their emotional reactions, with the risk of developing depression and other psychopathological symptoms (35), whereas males are more likely to externalize their emotional reactions (e.g., to get into a fight or hit another person). Beating the fist against something or someone seems to be a masculine response, and this behavior constitutes a transition between aggression against the outside world and aggression against the self (36).

The high rates of NSSI and indirect self-harming behavior indicate that NSSI and indirect self-harming behavior can no longer be understood just as symptoms of individual distress or psychopathology. When NSSI and self-harm appear as frequently as documented in this and several other studies, they constitute a so-called “social pathology” (2). The term *social pathology* refers to a condition that is so common in the culture during a certain period of time that it becomes a public health problem. This is the case when three to four students in each grade have had at least one incidence of NSSI and when more than half of them have engaged in one or more types of indirect self-harm.

In contrast with the point of view that NSSI is a serious problem, Adler and Adler (37) consider NSSI as a non-pathological act, which they describe as a “voluntarily chosen deviant behavior.” They stress that NSSI represents a kind of symbolic interaction rather than purely a medical problem, and thus they understand NSSI to be a normal behavior among young people as a product of “their active choice and free will.”

This point of view corresponds with the self-perception of some of the students who perform NSSI and indirect forms of self-harming behaviors.

During the interviews for the current study, some of the students stated that, in their opinion, alcohol blackout is *not* a self-harming behavior but rather a result of a certain kind of lifestyle.

Many young people reach the point of blackout (i.e., amnesia for the drinking episode) once or twice before they actually learn how much alcohol they can tolerate without becoming ill. A male student told us that “everybody has tried to have too much to drink. This is part of the ordinary high school culture.”

As the results of this study are assessed, we must be careful to not medicalize a behavior that may be “a part of the ordinary high school culture.” Further research is needed to judge the qualitative aspects of the findings of this study.

Limitations of the study

This study is based on self-report questionnaires. Self-reporting comes with the possibility of a retrospective bias, and the impact of this is impossible to determine. This is a common limitation of psychological research.

It is also a limitation of this study that it has no quantification of the amount of indirect self-harm. Students only indicated whether they had deliberately starved themselves or deliberately vomited when having eaten too much, whether they had consumed alcohol to the point of blackout, and whether they had taken drugs (e.g., amphetamines, LSD, heroin). If it happened only once, it does not constitute a problem for the person who has performed the indirect self-harming behavior. Young people experiment with lifestyle choices, including alcohol, drugs, and food.

Another limitation of the study is the list of NSSI opportunities (i.e., cutting, burning, scratching, or hitting oneself). Studies indicate that the use of a checklist will yield higher figures for NSSI. However, in this study, it is a limitation as well, because some NSSI opportunities that seem to be common in other studies (e.g., biting, hair pulling, sticking pins into the skin) have been omitted. It was not possible to track all students who engage in NSSI, so this study provides a conservative estimate of the prevalence of NSSI.

Finally, the gender bias must be mentioned. Only 39% of the respondents were males, but this is roughly equivalent to what has been seen in similar studies (38). Gender bias may influence the outcome of the study, especially because it is focused on gender differences. Further research must be conducted to confirm our findings.

Clinical significance

Among young people in the Western world, NSSI and indirect self-harm seem to be big issues, and the

main findings of this study confirm this. Teachers, school counselors, educators, and clinicians must be aware of the connection between NSSI and indirect self-harm, especially among young males, and they must look for other signs of NSSI in addition to scars and other marks of cutting. Males often beat themselves, which can leave signs that may easily be mistaken for sports injuries or consequences of a wild and careless lifestyle (e.g., a black eye).

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Declaration of interest

The authors have declared that there is no conflict of interest.

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Appendix

Self-Harm Questionnaire

Sex Male Female (put a mark)

Grade 1.g 2.g 3.g

Have you ever in your life deliberately harmed yourself (for example cut, burned, scratched, or hit yourself) without the intention of killing yourself?

Yes No

If you answered **yes** to the question above, please go on to the next questions:

How did you harm yourself?

Cut yourself (cutting) Yes No

Burned yourself Yes No

Scratched yourself Yes No

Hit yourself Yes No

Other _____

How many times have you deliberately harmed yourself within the last year?

Once 1-5 times 6-20 times >20 times

Have you ever deliberately starved yourself and/or deliberately vomited when having eaten too much?

Yes No

Have you ever drunk so much alcohol that you blacked out?

Yes No

Have you ever taken drugs (amphetamine, LSD, heroin, or the like)?

Yes No

If you have any questions or remarks about self-injury or the questionnaire, please send an e-mail to bo.moehl@regionh.dk

Many thanks for your help!

Bo Møhl, Chief Psychologist